CLAIMS

What we claim is:

1. An isolated nucleic acid containing at least fifty nucleotides wherein the nucleotide sequence for said nucleic acid is selected from the group consisting of:

(a) SEQ. ID. NOS.: 1, 5, 23 and nucleotide sequences complementary to SEQ. ID. NOS.: 1, 5 or 23;

(b) nucleotide sequences that hybridize under standard stringent hybridization conditions to one or more of the following nucleotide sequences: SEQ. ID. NOS.: 1, 5, 23 and the respective complements of SEQ. ID. NOS.: 1, 5 and 23; and

(c) nucleotide sequences that but for the degeneracy of the genetic code would hybridize under standard stringent hybridization conditions to one or more of the following nucleotide sequences: SEQ. ID. NOS.: 1, 5, 23 and the respective complements of SEQ. ID. NOS.: 1, 5 and 23.

2. An isolated nucleic acid according to Claim 1 which encodes an MN protein or polypeptide.

3. An isolated nucleic acid according to Claim 1 wherein the nucleotide sequence for said nucleic acid is selected from the group consisting of:

(a) SEQ. ID. NO.: 23 and its complement;

(b) nucleotide sequences that hybridize under standard stringent hybridization conditions to SEQ. ID. NO.: 23 or to its complement; and

(c) nucleotide sequences that but for the degeneracy of the genetic code would hybridize under standard stringent hybridization conditions to SEQ. ID. NO.: 23 or to its complement;

wherein the nucleic acids represented by the nucleotide sequences of (b) and (c) function to identify MN nucleic acid sequences.

4. An isolated nucleic acid containing at least fifty nucleotides which is selected from the group consisting of nucleic acids which hybridize under standard stringent hybridization conditions to a nucleic acid encoding a protein having the amino acid sequence of SEQ. ID. NO.: 6.

5. An isolated nucleic acid, containing at least fifty nucleotides, encoding an MN protein or polypeptide that is specifically bound either by monoclonal antibodies designated M75 secreted by the hybridoma VU-M75 deposited at

the American Type Culture Collection (ATCC) in Rockville, Maryland in the United States of America under ATCC No. HB 11128, or by monoclonal antibodies designated MN12 secreted by the hybridoma MN 12.2.2 deposited at the ATCC under ATCC No. 11647, or by both of said monoclonal antibodies.

6. An isolated nucleic acid according to Claim 1 operatively linked to an expression control sequence within a vector.

7. A unicellular host which is either prokaryotic or eukaryotic that is transformed or transfected with the isolated nucleic acid operatively linked to an expression control sequence in a vector according to Claim 6.

8. A unicellular host according to Claim 7 which is an insect cell or an E. coli cell.

9. An MN protein or polypeptide encoded by the isolated nucleic acid according to Claim 2.

10. A fusion protein comprising at least a first and a second amino acid wherein the first amino acid is encoded by an isolated nucleic acid according to Claim 2, and wherein the second amino acid is a non-MN protein or polypeptide.

11. A fusion protein according to Claim 10 that is either the GEX-3X-MN protein or the MN 20-19 protein.

12. A method of recombinantly producing an MN protein or polypeptide wherein a baculovirus expression system is used comprising the steps of:

(a) transforming an appropriate unicellular host with an isolated nucleic acid operatively linked to an expression control sequence in a vector according to Claim 6;

(b) culturing said unicellular host so that said MN protein or polypeptide is expressed; and

(c) extracting and isolating said MN protein or polypeptide.

13. An antibody which specifically binds to an epitope of an MN protein or polypeptide according to Claim 9.

14. An antibody according to Claim 13 which is monoclonal.

15. A monoclonal antibody of Claim 14 which is designated MN12 and is secreted by the hybridoma MN 12.2.2 that was deposited at the American Type Culture Collection (ATCC) under ATCC No. HB 11647.

16. A hybridoma which secretes the monoclonal antibody according to Claim 15 which was deposited at the American Type Culture Collection (ATCC) under ATCC No. HB 11647.

17. An antibody according to Claim 13 which specifically binds to an MN antigen epitope selected from the group of epitopes represented by the following amino acid sequences: SEQ. ID. NOS. 10-16.

18. An antibody according to Claim 17 wherein said sequences are SEQ. ID. NOS.: 10, 11 and 12.

19. An antibody according to Claim 18 wherein said sequences are SEQ. ID. NOS.: 10 and 11.

20. An antibody according to Claim 13 which was prepared against nonglycosylated GEX-3X-MN protein.

21. An antibody according to Claim 13 which was prepared against glycosylated MN 20-19 protein.

22. An antibody according to Claim 13 which is linked to a chemotherapeutic agent or a toxic agent.

23. A method of delivering a chemotherapeutic agent or toxic agent to a cancer cell which comprises contacting said cell with an antibody according to Claim 22.

24. An antibody according to Claim 13 which is linked to an imaging agent.

25. A method of imaging pre-neoplastic or neoplastic disease in a patient comprising:

(a) injecting said patient with antibody according to Claim 24; and

(b) detecting the binding of said antibody.

26. A method of detecting and/or quantitating in a vertebrate sample MN antigen comprising the steps of:

(a) contacting said sample with an antibody according to Claim 13; and

(b) detecting and/or quantitating binding of said antibody in said sample.

27. The method according to Claim 26 wherein said detecting and/or quantitating is by immunohistochemical staining.

28. The method according to Claim 26 which is diagnostic/prognostic for pre-neoplastic/neoplastic disease.

29. A method of detecting and/or quantitating MN-specific antibodies in a vertebrate sample comprising the steps of:

(a) contacting and incubating the vertebrate sample with a fusion protein according to Claim 10; and

(b) detecting and/or quantitating binding of said fusion protein to antibody in said sample.

30. A method of treating neoplastic disease and/or pre-neoplastic disease comprising inhibiting the expression of MN genes by administering one or more antisense nucleic acid sequences that hybridize to mRNA transcribed from MN genes.